

REMARKS

Claims 88-156 are pending in the application. Claims 90, 92, 100, 107, 116, 123, and 129 have been amended to place them in better form. Claims 133-156 have been added. The specification has been amended to place it in better form. Reconsideration is respectfully requested.

In paragraph 4, the Office Action objects to the specification "because [t]he Applicant's have a description as a table of contents on pages 8-9."

Applicants have amended the specification to remove the table of contents and overcome the objection.

In paragraph 6, the Office Action objects to claims 90, 92, 100, 107, 116, 123, and 129 citing informalities.

Applicants have amended the claims to correct the informalities and to place them in better form.

In paragraph 8, the Office Action rejects claims 88-90, 105-107, and 121-123 under 35 U.S.C. 103(a) as being unpatentable over Hall et al. (U.S. Patent No. 5,675,785). Applicants respectfully traverse.

In particular, the Office Action cites Col. 3, lines 52-56 as teaching Applicants' claim element of "accessing at least one description wherein the description describes a database system." Col. 3, lines 52-56 states as follows:

In accordance with the preferred embodiment of the present invention, an intelligent database warehouse is presented. The database warehouse includes a database having data arranged in data tables, for example, in fact tables and reference tables.

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The above passage in the Hall patent does not teach or suggest "accessing at least one description." Instead, the Hall patent only states that a "database warehouse includes a database having data arranged in data tables."

Claim 88 states "populating a metadata schema with the description," which the Office Action says is taught by the Hall patent at Col. 6, lines 13-26. Col. 6, lines 13-26, which states as follows:

Intelligent warehouse hub 23 accepts incoming queries and issues the database operations to the underlying DBMS to satisfy optimally the end user request.

Intelligent warehouse hub 23 has the following responsibilities with respect to the execution of incoming queries. Intelligent warehouse hub 23 provides a schema which abstracts the definition of the physical data warehouse into one which is independent of which summaries are populated. Intelligent warehouse hub 23 determines which summary tables may be used to satisfy the needs of the incoming query. Intelligent warehouse hub 23 adapts the query to use the best summary available at the current time. Intelligent warehouse hub 23 adds "joins" to reference tables, "Group By" and "Sum" components to the query as necessary. For a discussion of SQL, see for example, C. J. Date, An Introduction to Database System, Addison-Wesley Publishing Company, Menlo Park, Calif., 1982.

The Hall patent mentions a schema, but does not teach or suggest the metadata schema claimed by applicants. Applicants' specification, on page 12, lines 19-20, states that the "system allows consultants to use metadata to define schemas for a datamart." Applicants' specification, on page 24, lines 11-17, describes a metadata schema as "a schema used in the system 100 to define schemas." Furthermore, Applicants' specification, on page 24, lines 14-16, states that "Figure 3 illustrates a schema for the schema definitions . . . Figure 3 is labeled the schema for schema definitions 300." The metadata schema, as illustrated in Figure 3, includes a set of physical tables. Moreover, the user interface example on pages 71-74 of Applicants' specification, which references Figures 7-16, provides further detail on Applicants' metadata schema. For example, sales dimensions 723 define rows in the

dimension role table 320 of the metadata schema of Figure 3. As can be seen with reference to Figures 7-16, a user submits a description using the user interface to describe a database system. Then, Applicants' invention accesses the description and populates the metadata schema with the description. That is, the metadata schema of applicants' invention is used to define a schema, and "[f]rom the definition of the schema, the system can automatically generate the tables in the datamart." (Applicants' specification, page 12, lines 20-21)

The schema of the Hall patent is not one that is used to define other schemas and it is not populated with a description. Instead, the Hall patent describes a schema that consists of virtual tables and against which a user submits queries (Col. 6, lines 48-50). Therefore, the schema of the Hall patent is not equivalent to the metadata schema of applicants' claimed invention. The schema of the Hall patent does not teach or suggest a metadata schema for use in defining a schema that is used to generate a database system.

Also rather than populating a metadata schema, the Hall patent teaches that "summaries are populated." The Office Action states as follows:

Hall did not explicitly teach populating a metadata schema with the description but it would have been obvious to one having ordinary skill in the art at the time the invention was made to populate the metadata schema with a description and to incorporate in Hall because such a modification would enhance Hall's fact and reference tables which contain the attributes of the entries in the fact table which are typically linked to the reference tables through one or more keyed columns containing code.

As the Hall patent does not teach or suggest the metadata schema of applicants' claim, it would not be obvious to populate the schema of the Hall patent. In fact, since the schema of the Hall patent already includes information, such as information "which abstracts the definition of the physical data warehouse into one which is independent of which summaries are populated," the Hall patent teaches away from populating a schema. Even if the schema of Hall were populated with additional information, that is not equivalent to populating a

metadata schema such as one illustrated in Applicants' Figure 3. Moreover, it is not clear to Applicants how the "Hall's fact and reference tables" would be enhanced by populating a schema.

Claim 88 states "automatically generating the database system according to the populated metadata schema," which the Office Action says is taught by the Hall patent at Col. 3, lines 57-67 and col. 4, lines 1-2. The Hall patent, at Col. 3, lines 57-67 and col. 4, lines 1-2, states as follows:

A warehouse database hub interface is connected to the database. The warehouse database hub interface presents to a user a logical schema of the data in the database warehouse. The schema consists of virtual tables. Arrangement of the data in the virtual tables is different than arrangement of data in the fact tables and the reference tables.

In general, a virtual schema is made up of virtual columns within virtual tables. In the present invention, virtual tables meet the requirements of a model for SQL and provide column grouping to simplify user location of virtual columns. Grouping is definable by the administrator and is not constrained to the physical implementation of the decision support database.

The cited passage of the Hall patent describes "a logical schema of the data in the database warehouse" and states that the "schema consists of virtual tables." As the Hall patent does not teach or suggest the metadata schema of applicants' invention, the Hall patent can not teach or suggest "automatically generating the database system according to the populated metadata schema." Moreover, the logical schema that consists of virtual tables describe in the Hall patent teaches away from Applicants' metadata schema, which is illustrated in Figure 3 and which is populated with a description that describes a database system.

Claim 88 states "using the database system according to the populated metadata schema," and, since the metadata schema of Applicants' invention is not taught or suggested

by the Hall patent, using a database system according to such a metadata schema is not taught or suggested by the Hall patent.

Dependent claims 89 and 90 incorporate the language of independent claim 1 and add further novel elements. Dependent claims 89-90 are not obvious in view of the Hall patent for at least the same reasons as independent claim 88. In particular, claim 89 is directed to automatically generating an actual table schema and populating the actual table schema. On the other hand, the Hall patent describes the schema as consisting of virtual tables and describes "a separation between the physical layout of the database warehouse and the virtual tables and columns presented to end users." (Col. 4, lines 47-50) By teaching that the schema consists of virtual tables, the Hall patent teaches away from Applicants' claimed actual tables.

Moreover, claim 90 is directed to "automatically generating one or more aggregates according to the populated metadata schema" and "automatically generating one or more query mechanisms according to the populated metadata schema." The Hall patent states: "PC intelligent warehouse tool 24 builds SQL statements based on this schema . . . summary aggregations (SUM()) are automatically performed." (Col. 6, lines 62-67.) As the Hall patent does not teach or suggest Applicants' metadata schema, the Hall patent does not teach or suggest Applicants' generating aggregates according to a populated metadata schema or automatically generating one or more query mechanisms according to the populated metadata schema. Also, stating that summary aggregations are performed does not teach or suggest Applicants' generating aggregates according to a populated metadata schema.

The Office Action rejected claims 105, 106, 107, 121, 122, and 123, for the same reasons as given for claims 88, 89, and 90. The Applicants arguments with respect to claims 88, 89, and 90 apply to claims 105, 106, 107, 121, 122, and 123.

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Therefore, claims 88, 89, 90, 105, 106, 107, 121, 122, and 123 are not obvious in light of the Hall patent.

In paragraph 10, the Office Action rejects claims 91-104, 108-120, and 124-132 under 35 U.S.C. 103(a) as being unpatentable over Hall et al. (U.S. Patent No. 5,675,785) in view of Anand et al. (U.S. Patent No. 5,721,903). Applicants respectfully traverse.

Dependent claims 91-104, 108-120, and 124-132 incorporate the language of independent claims 88, 105, and 121 and add further novel elements. Dependent claims 91-104, 108-120, and 124-132 are not obvious in light of the Hall patent in view of the Anand patent.

The Anand patent fails to cure the deficiencies of the Hall patent. In particular, the Anand patent does not teach or suggest Applicants' metadata schema. The Anand patent merely describes a system and method for generating a report for a user. (Abstract). The Anand patent does not teach or suggest Applicants' claimed elements of accessing at least one description, wherein the description describes a database system, populating a metadata schema with the description, automatically generating the database system according to the populated metadata schema, and using the database system according to the populated metadata schema.

Combining the Hall and the Anand patent does not result in Applicants' claimed database system that is generated according to a populated metadata schema. As neither the Hall nor the Anand patents, either alone or together, teaches or suggests the elements of Applicants' independent claims 88, 105, and 121, neither the Hall nor the Anand patents, either alone or together, teaches or suggests Applicants' dependent claims 91-104, 108-120, and 124-132.

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Applicants have added new claims 133-156, which are directed to “generating one or more database systems.” In particular, a metadata system that includes a metadata schema, a facility for entering instructions into the metadata schema, and a facility for manipulating the metadata schema is provided. Instructions are received from a user, wherein the instructions are entered into the metadata schema and are used to create a business database system. The business database system is automatically generated according to the instructions contained in the metadata schema such that the business database system is well-formed. Data is loaded into the business database system according to the instructions contained in the metadata schema. The business database system is operated on according to the instructions contained in the metadata schema. Neither the Hall nor the Anand patent, either alone or together, describes Applicants’ metadata schema or other claimed elements. Therefore, claims 133-156 are not obvious in view of either the Hall patent or the Anand patent, or a combination of these patents.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned “**Version with markings to show changes made.**”

It is respectfully submitted that the present application with pending Claims 88-156 is allowable, and allowance is respectfully requested of claims 88-156.

If there are any questions regarding the above Reply, the Examiner is respectfully invited to contact the undersigned at (949) 718-5200.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Please change the heading "The Description" to --Detailed Description-- on page 8, line 1.

Please delete the text starting on page 8, line 2 and continuing through page 9, line 24.

In the Claims:

Please amend claims 90, 92, 100, 107, 116, 123, and 129 as follows:

90. (Amended) The method of Claim 88, wherein automatically generating the database system includes:

automatically generating one or more aggregates according to the populated metadata

[scheme] schema; and

automatically generating one or more query mechanisms according to the populated metadata [scheme] schema.

92. (Amended) The method of Claim 91, further comprising:

querying the database system in response to a query request received from one or more client computers over a computer network;

sending the results of the querying to one or more of the client computers;

generating the reports in response to a report request received from one or more of the client computers over a computer network; and

sending the results of the report generating to one or more of the client computers[;].

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100. (Amended) The method of Claim 96, wherein automatically modifying the database system includes:

automatically modifying one or more aggregates according to the re-populated metadata [scheme] schema; and

automatically modifying one or more query mechanisms according to the re-populated metadata [scheme] schema.

107. (Amended) The computer system of Claim 105, wherein the computer program further includes computer instructions for:

automatically generating one or more aggregates according to the populated metadata [scheme] schema; and

automatically generating one or more query mechanisms according to the populated metadata [scheme] schema.

116. (Amended) The computer system of Claim 113, wherein the computer program further includes computer instructions for:

automatically modifying one or more aggregates according to the re-populated metadata [scheme] schema; and

automatically modifying one or more query mechanisms according to the re-populated metadata [scheme] schema.

123. (Amended) The computer-readable storage medium of Claim 121, wherein the database system computer program further comprises computer instructions for:

automatically generating one or more aggregates according to the populated metadata [scheme] schema; and

automatically generating one or more query mechanisms according to the populated metadata [scheme] schema.

129. (Amended) The computer-readable storage medium of Claim 125, wherein the database system computer program further comprises computer instructions for:

automatically modifying one or more aggregates according to the re-populated metadata [scheme] schema; and

automatically modifying one or more query mechanisms according to the re-populated metadata [scheme] schema.

Please add new claims 133-156 as follows:

133. (New) A method of generating one or more database systems, the method comprising:

providing a metadata system that includes a metadata schema, a facility for entering instructions into the metadata schema, and a facility for manipulating the metadata schema;

receiving instructions from a user, wherein the instructions are entered into the metadata schema and are used to create a business database system;

automatically generating the business database system according to the instructions contained in the metadata schema such that the business database system is well-formed;

loading data into the business database system according to the instructions contained in the metadata schema; and

operating on the business database system according to the instructions contained in the metadata schema.

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134. (New) The method of claim 133, wherein automatically generating the business database system further comprises:

automatically generating tables according to the instructions.

135. (New) The method of claim 133, wherein loading data into the business database system further comprises:

extracting data from sources specified in the instructions;

loading the data into staging tables; and

loading the data from the staging tables into the business database system based on semantic definitions provided in the instructions.

136. (New) The method of claim 133, further comprising:

building aggregate tables according to the instructions.

137. (New) The method of claim 133, wherein operating on the business database system further comprises:

receiving further instructions from a user to define a query mechanism; and

generating queries according to the further instructions.

138. (New) The method of claim 133, wherein operating on the business database system further comprises:

generating reports according to the instructions.

139. (New) The method of claim 133, further comprising:

receiving a modification of the metadata schema; and

automatically adjusting the business database system according to the modification.

140. (New) The method of claim 133, further comprising:

wherein the instructions provide semantic definitions; and

wherein the business database system is automatically generated using the semantic definitions such that the business database system is well-formed.

141. (New) A computer system, comprising:

a computer including a processor and a memory;

a computer program stored in the memory and executed by the processor, wherein the computer program includes instructions for:

providing a metadata system that includes a metadata schema, a facility for entering instructions into the metadata schema, and a facility for manipulating the metadata schema;

receiving instructions from a user, wherein the instructions are entered into the metadata schema and are used to create a business database system;

automatically generating the business database system according to the instructions contained in the metadata schema such that the business database system is well-formed;

loading data into the business database system according to the instructions contained in the metadata schema; and

operating on the business database system according to the instructions contained in the metadata schema.

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142. (New) The computer system of claim 141, wherein the computer program further includes computer instructions for:

automatically generating tables according to the instructions.

143. (New) The method of claim 141, wherein the computer program further includes computer instructions for:

extracting data from sources specified in the instructions;

loading the data into staging tables; and

loading the data from the staging tables into the business database system based on semantic definitions provided in the instructions.

144. (New) The method of claim 141, wherein the computer program further includes computer instructions for:

building aggregate tables according to the instructions.

145. (New) The method of claim 141, wherein the computer program further includes computer instructions for:

receiving further instructions from a user to define a query mechanism; and

generating queries according to the further instructions.

146. (New) The method of claim 141, wherein the computer program further includes computer instructions for:

generating reports according to the instructions.

147. (New) The method of claim 141, wherein the computer program further includes computer instructions for:

receiving a modification of the metadata schema; and

automatically adjusting the business database system according to the modification.

148. (New) The method of claim 141, wherein the computer program further includes computer instructions for:

wherein the instructions provide semantic definitions; and

wherein the business database system is automatically generated using the semantic definitions such that the business database system is well-formed.

149. (New) A computer readable storage medium encoded with software instructions, wherein execution of the instructions comprises:

providing a metadata system that includes a metadata schema, a facility for entering instructions into the metadata schema, and a facility for manipulating the metadata schema;

receiving instructions from a user, wherein the instructions are entered into the metadata schema and are used to create a business database system;

automatically generating the business database system according to the instructions contained in the metadata schema such that the business database system is well-formed;

loading data into the business database system according to the instructions contained in the metadata schema; and

operating on the business database system according to the instructions contained in the metadata schema.

150. (New) The computer readable storage medium of claim 149, wherein execution of the instructions further comprises:

automatically generating tables according to the instructions.

151. (New) The computer readable storage medium of claim 149, wherein execution of the instructions further comprises:

extracting data from sources specified in the instructions;

loading the data into staging tables; and

loading the data from the staging tables into the business database system based on semantic definitions provided in the instructions.

152. (New) The computer readable storage medium of claim 149, wherein execution of the instructions further comprises:

building aggregate tables according to the instructions.

153. (New) The computer readable storage medium of claim 149, wherein execution of the instructions further comprises:

receiving further instructions from a user to define a query mechanism; and

generating queries according to the further instructions.

154. (New) The computer readable storage medium of claim 149, wherein execution of the instructions further comprises:

generating reports according to the instructions.

155. (New) The computer readable storage medium of claim 149, wherein execution of the instructions further comprises:

receiving a modification of the metadata schema; and

automatically adjusting the business database system according to the modification.

156. (New) The computer readable storage medium of claim 149, wherein execution of the instructions further comprises:

wherein the instructions provide semantic definitions; and

wherein the business database system is automatically generated using the semantic definitions such that the business database system is well-formed.

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